

Challenges and Opportunities: Canadian Environmental Technologies and Services in the Egyptian Market

> CANADIAN ENVIRONMENTAL SOLUTIONS

> > MARKET REPORT

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BACKGROUND

The dynamic Middle East/North Africa (MENA) region is steadily growing in importance. In 1997, Canadian exports to the region grew by about 7 percent. Last year, the total value of two-way merchandise trade between Canada and the MENA region reached \$5.7 billion; almost \$3.3 billion of which were Canadian exports. Adding exports of Canadian services would increase this figure by an estimated additional \$1 billion. The MENA region is currently a larger market for Canadian exports than China. In 1996 the region's annual imports grew by over 16 percent to a total of \$267 billion. While accounting for a small percentage of Canada's total exports, the MENA region offers impressive growth potential to Canadian exporters. Access to these countries is no more difficult than to Asian and Latin American markets although certain cultural factors specific to the region must be taken into account before doing business in this area.

While oil and gas, telecommunications and high technology, transportation and agri-food generally offer the best prospects, the environmental sector is very active and poised to benefit from substantial developments as a large number of MENA countries move toward privatization and trade liberalization, and the Middle East peace process asserts itself.

Main markets:

- Oil & gas
- Telecommunications
- High technology
- Transportation
- Agri-food

Emerging markets:

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- Environment
- Energy
- Services (Education/financial)
- Mining

Four major environmental challenges face the Middle East and North Africa:

- over 60 million people are exposed to urban air pollution of particulates, lead and sulfur dioxide. This
 could increase to 160 million in 10 years;
- 45 million people lack safe drinking water and 85 million lack safe sanitation, mostly in rural areas;
- most countries already consume more freshwater resources than can be renewed, relying on depletion
 of non-renewable aquifers and/or expensive desalinization of seawater;
- land, pasture and forest degradation is threatening the livelihoods of millions of rural poor whose sustenance depends on their surroundings.

MARKET PROFILE

As the largest Arab country, and the first to make peace with Israel, Egypt is at the centre of regional political and economic initiatives. By virtue of its population of nearly 62 million people, the Egyptian market is one of the largest in the MENA region. Canada enjoys excellent relations with Egypt. Canadian exports to Egypt grew by almost 19% last year, while imports from Egypt increased by nearly 51% in 1997.



Canadian Exports to Egypt



EGYPT AT A GLANCE

Canada's principal exports: \$185 million (1997), mostly newsprint, machinery, autoparts, coal, optical/medical instruments, wood, wood pulp, lentils, butter, linseed, etc.

Canada's imports: \$29 million (1997), mostly wire rods, knit apparel, carpets, woven apparel, furniture & bedding, cotton & yarn, vegetables, etc. *Lending institutions:* World Bank, African Development Bank, Kuwait Fund, Arab

Fund Priority sectors: environmental equipment and services, energy and power

initiatives, agricultural and dairy development, oil and gas exploration and recovery and telecommunications upgrades.

1992 World Bank study conducted in cooperation with the Egyptian government resulted in an Action Plan that focuses on the following issues:

- The dual concern of very limited water resources and increasing pollution of current water supplies about 90% of Egypt's used water goes untreated while probably 80% of industrial wastewater is discharged unmonitored;
- Wind erosion, lack of flooding to enrich the soil and over-use of agricultural land is reducing the quality and quantity of farm production;
- Increasing industrialization is resulting in significant air pollution over Cairo and Alexandria, with the ancillary destruction of nearby antiquities;
- Rapid growth of the urban population and industrialization means that municipal and industrial waste are increasingly a problem. Hazardous waste from industrial activities is estimated to comprise some 20 to 50 thousand tons per year out of total industrial waste of three to five million tons per year;
- Coastlines along the Mediterranean and Red Sea, and their ancillary marine life, are important but underdeveloped economic and tourist resources, and suffer from significant deterioration due to pollution.

The Action Plan opened the way for the passage of a new Environmental Conservation Law (Law 4 of 1994) which combined the Clean Air Act and Marine Environment Act and associated penalties with new sections on hazardous waste and environmental management.

The first Egyptian Ministry of State for Environmental Affairs was established in the summer of 1997, and the government is projecting a budget of US \$2.6 billion to execute its environmental plan through to the year 2007. Management of natural resources, particularly water and arable land dominate the plan's agenda. The Egyptian government is focussing on more efficient use of these natural resources, while simultaneously improving the urban environment and protecting its enormous archeological heritage. Specific opportunities for Canadians include: MSW incinerators, water treatment and purification systems, sewage treatment facilities and engineering, technology and consulting services.

In July, 1997 the Cairo Air Improvement Project (CAIP), a US\$56 million USAID funded 7-year project was

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started under the umbrella of the Egyptian Environmental Affairs Agency (EEAA). CAIP addresses lead emissions in small, private smelting facilities; converting public transportation to natural gas; adjusting vehicle emissions; air quality monitoring in Cairo; policy development for controlling lead in the environment; public education and outreach; and, analytical comparisons and identification of other contaminants.

In late 1997, the World Bank, in co-operation with the Egyptian government, began implementing the Egyptian Pollution Abatement Project (worth approximately \$75 million over six years) to reduce emission and discharges in critical environment-related areas and sectors. As well, CIDA supports an Egypt Environmental Initiatives Fund project (\$20 million over seven years) to promote the sound management and conservation of Egypt's natural resources.

The Mediterranean Environmental Technology Assistance Program (METAP), another program of the World Bank, is a regional facility and is now in its third and final phase (1996 - 2000). A sum of \$100 million has been allocated to this phase and will be used for implementation of concrete projects in three integrated priority areas: capacity building, participation and partnerships; arresting and prevention of pollution at 'hot spots'; and integrated water and coastal areas resource management.

The lotal estimated environmental market size in 1997 was US\$1.06 Billion. Table 1 shows the breakdown of the market segments. The market is currently mainly serviced by five countries as indicated in Table 2.

Table 1: Environmental Markets by Segment 1997 Estimate Segment (in US\$ million)

	• • •	
Municipal water and wastewater treatment	710	
ndustrial wastewater treatment	125	
Air pollution control	125	
Environmental consulting	40	
Renewable energy (mostly wind)	20	
Naste recycling services and equipment	10	
Environmental monitoring and testing	10	
Invironmental monitoring and testing	10	
Nobile source air pollution	10	

Table 2: Environmental Market Share of Cor.)petitors t	by Coun	try
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Country	Percentage Share		
United States	45	~	
United Kingdom	20		
France	12		
Germany	9		
Italy	9		
Locally sourced	5		

Statiscial data specifically for environmental equipment are either not accurate or unavailable.

Estimates are based on industry sources, publications, and government officials.

BUSINESS OPPORTUNITIES IN THE ENVIRONMENT SECTOR

1. Municipal Water and Wastewater Treatment

Municipal water and wastewater treatment, including engineering, construction, training and operation is an attractive market in Egypt, with a growth rate of approximately 10% to 15% per year. To date, the market has been driven primarily by donor funding for infrastructure projects. Although donor funding is expected to continue, the Government is also committed to spending significant funds of its own on municipal water and wastewater projects, especially for smaller cities and rural areas.

The continued growth of this large market creates business opportunities for foreign and local firms. However, because many of the latter companies already provide goods and services in the municipal water and wastewater market, competition is stiff.

For foreign companies, opportunities exist for environmental engineering and the design of new treatment

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systems, sales of equipment for pump stations and wastewater treatment plants, and possibly operation and maintenance contracts for secondary treatment facilities. For joint ventures with Egyptians, there are opportunities to construct new sewers, manufacture and sell components for small scale water and waste water treatment facilities, and to manufacture and sell PVC pipes and valves. There may also be opportunities to train, operate and maintain existing water and wastewater facilities.

Clients for projects in this sub-sector are water authorities and municipal governments. Many of the government authorities are inefficiently run, and suffer from a shortage of trained staff, operational funding and incentives. Economic and policy reforms are being proposed, or are already underway that will increase water prices to consumers and thus permit almost full cost recovery for water services. Eventually these reforms will enable water authorities to operate as autonomous regulated utilities, with improved ability to plan capital expenditures and to operate without donor or even Egyptian government support.

2. Industrial Wastewater Treatment

The market for industrial wastewater treatment is at an early stage of development in Egypt. Both public and private sector polluters frequently mention the inevitability of having to address this issue. Estimates of current market size are difficult to obtain. Until recently, according to a report from the Ministry of Industry, public sector industries have spent less than US\$5 million per year on wastewater treatment, most of which has been in the chemical, food processing and textile industries. However, a considerable increase in allocation of resources to wastewater treatment has occurred as a consequence of regulations and the government's serious enforcement of these regulations.

Estimates of Egypt's requirements to treat its industrial effluent to North American standards range from US\$1.2 billion to US\$2.2 billion. Over the short term, demand will be for unsophisticated technologies that can be easily operated and maintained, and that will treat the most obvious pollutants. Process changes, improved water conservation and reuse will be emphasized. Few full waste treatment systems have been installed, and some systems that are in place are not working due to a lack of adequately trained operators and/or spare parts. Sophisticated effluent treatment equipment is not being manufactured locally, although most of the peripheral equipment may be locally produced. In general, access to a broader range of technologies is needed.

Potential clients include public sector industrial companies in the Cairo and Alexandria areas, and many private sector companies in the new industrial cities of 10th of Ramadan, 6th of October, New America and others.

3. Point Source Air Pollution Control

Point source air pollution comes from industrial activities and thermal power plants. Egypt's largest concentrations of air pollution are in industrial areas surrounding Cairo and Alexandria. The methods for addressing air pollution include increasing prices to reduce consumption, implementing energy saving programs, converting to cleaner fuels such as natural gas and installing pollution control equipment. According to the Egyptian Environmental Affairs Agency (EEAA), a combination of all these methods will be used to address Egypt's air pollution problems. The market for pollution control equipment and services is expected to grow as enforcement increase. However, the Egyptian Government may be reluctant to invest in advanced pollution control technologies without first trying to reduce energy consumption and encourage fuel substitution.

4. Environmental Consulting and Training Services

Consulting services and training services are needed to develop and implement environmental policies and practices, conduct environmental audits, and incorporate environmental management practices into new facilities and projects. Environmental issues related to certain sectors, such as tourism and the management of Egypt's antiquities, are relatively new and will also require technical expertise.

Some environmental consulting expertise exists in Egypt, but much more will be required. Until more local environmental consultants are trained, there will be a market for foreign environmental consultants acting alone, or in partnership or joint venture with Egyptian firms and individuals. Environmental training services are also in strong demand. A good portion of the demand for environmental consulting will initially come from the World Bank, the Egyptian Environmental Affairs Agency (EEAA) and other donor-funded projects. The number and range of potential clients for environmental consulting are the largest of a categories of environmental business. Central ministries and authorities, governorate, public sector industries, research institutes, private sector companies and foreign corporations are all potential clients for environmental consultancy services.

5. Renewable Energy

Renewable energy is extracted from non-depletable resources such as sunlight, wind, geothermal heat, hydropower and plant matter. The impact of this type of energy on the environment relative to other energy sources is minimal. In Egypt, sunlight and wind are the most abundant and best-suited renewable energy resources. Some wind machines are being used on a pilot basis to generate electricity in the Red Sea/South Sinai region.

The Egyptian Government's Five Year Plan, 1992-1997, calls for the procurement and installation of an estimated US\$66.8 million in wind turbines. However, the Ministry of Electricity has been the sole buyer of wind-generated electricity, and to date all purchases have been made only with donor funds.

In 1986, the Ministry of Electricity established the New and Renewable Energy Authority (NREA), which is currently considering several wind farm projects on an experimental basis. The clientele is limited, however, because the Egyptian Electricity Authority has a full monopoly on generating and selling electricity. However private developers are permitted to install such systems for new tourist communities.

Solar water heaters are generally used on a small scale to heat water for commercial and residential buildings. The potential clientele for solar water heaters consists of those public or private sector building owners or development companies for whom this system is economically advantageous.

6. Waste Recycling and Associated Businesses

Recycling activity in Egypt is already considerable. The potential for upgrading the quality of recyclable products and adding new products is good. Also, more efficient waste collection and a growing urban population will increase the demand for recycling equipment and recyclable products. Currently, some plastic, rubber, cooking oil, batteries, metals, glass and certain organic wastes are recycled on a sporadic and highly local basis.

The best new opportunities are in recycling of paper, plastic and motor oil. The potential market for large scale recycling plants has spurred some Egyptian companies to begin seeking foreign recycling plant manufacturers to form joint ventures.

The market for recycled products includes individual consumers and small-scale industries. The buyers of raw waste and recycling equipment are the many small-scale and some large private recyclers, including the Zaballeen (a garbage collection and recycling collective). New entrants to the market may include large pulp and paper and chemical (plastic) companies.

7. Environmental Monitoring and Testing

To improve environmental management programs, Egypt must first develop and improve its monitoring and testing capabilities for air, water and soil pollution. Over the next 5 years, increased sales to the Government of imported monitoring and sensing equipment can be anticipated if enforcement and monitoring programs are implemented. Increased demand for laboratory testing services would accompany the development of new monitoring programs. The driving force however includes 1) the level and timing of the government's enforcement of new or existing regulations, and 2) new environmental legislation that includes budgets for more monitoring and testing, and the equipment necessary to do so.

The Government and its ministries are the major clients for monitoring and testing programs. Research institutes are potential clients for equipment, although several research institutes, such as the Tebbin Institute for Metallurgical Studies, already have fully equipped environmental testing laboratories supplied by grants from international donors.

Several donor agencies are currently working on environmental projects that contain monitoring and testing components, including additional equipment. Over the next three to ten years, private laboratories and industrial companies may emerge as potential clients for laboratory equipment and services.

8. Mobile Source Air Pollution Control

Emissions from transportation vehicles contribute substantially to the air pollution in Egypt, especially in Cairo. High air pollution levels have been linked to incidences of several medical conditions. The number of vehicles in Greater Cairo increased by 10% per year from 1980 to 1992, and is projected to continue increasing throughout the rest of the century.

Improved enforcement of Egyptian Government standards for vehicle maintenance, or an increase in fuel prices to encourage optimal engine maintenance will create an opportunity for the private sector to provide vehicle repair and maintenance facilities. If cleaner burning fuels are mandated, owners of private vehicles will naturally be the major customers, but Government vehicle fleets will also constitute a significant market share for cleaner fuels. Indeed, such a mandate may actually be applied to government fleets first and individual vehicle owners later.

9. Municipal and Hazardous Solid Waste Collection and Disposal

The outlook is promising for municipal and hazardous solid waste collection and disposal equipment and services in Egypt. There is currently a more pressing demand for services and equipment dealing with municipal solid waste (MSW), than for hazardous waste, but both are important and growing. In general, the sale of larger pieces of equipment (e.g. garbage trucks, incinerators) represents the best opportunities for

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foreign firms. Hazardous waste services, particularly those requiring training or possessing a high degree of technological sophistication must be supplied by foreign companies.

The need for household waste collection is urse greatest in urban areas. The current collection system is unsatisfactory and largely ineffective given is in needs. Assuming a favourable government response, the market is expected to grow significantly over the next decade due to a growing population and current insufficiencies.

Hazardous chemical and fertilizer wastes are also discarded in an uncontrolled manner, with little regard to site preparation or location. Given the Egyptian Government's interest in improving regulations controlling industrial polluters, companies able to provide better disposal services will be sought by local industries wishing to comply with regulations.

At present, most hospital waste (including hazardous and infectious waste) is mixed with municipal waste. However, as hospitals are forced to comply with new laws, a market for specialized incinerators will develop.

The growing number of private companies providing MSW collection services indicate that private firms will increasingly be the buyers of garbage collection and disposal equipment. Financial resources available for municipal waste disposal equipment have been limited relative to the volume of garbage generated. Egyptian municipalities will probably be the main purchasers of composters, landfilling equipment and incinerators, but the operation of such facilities may be contracted out to private companies.

Both private and public sector industries will require industrial solid and hazardous waste treatment and disposal equipment and services over the next few years, as environmental regulations have become more stringent. Proposed municipal wastewater treatment plants in Cairo and Alexandria will create 700 to 1,000 kilo tons of sewage sludge per year. These plants are potential buyers of sludge disposal equipment.

10. Others

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Other areas of particular concern include integrated coastal zone management and sustainable tourism development.

GOVERNING AUTHORITY

The Egyptian Environmental Affairs Agency (EEAA) is the governmental authority in charge of managing this sector and its activities. With the passing of a new Environmental Protection Law 4 in 1994, and its Executive Regulations in March 1995, the EEAA was given more power and resources to enable it to effectively control the activities related to this sector, and to ensure that the new law is successfully implemented.

The EEAA sector areas of action include industrial, municipal and hospital solid waste; land and water resources; cultural heritage; awareness and education; monitoring; natural heritage; coastal zone management; urban air pollution and hazardous industrial waste. The Technical Office for the Environment (TCOE) was established in 1991 to serve as the technical secretariat and think-tank of EEAA and to operationalize the Environmental Action Plan of 1992 while coordinating and mobilizing donor resources and funds for environmental protection.

UPCOMING OPPORTUNITIES

Canada is perceived as a competitive source of products and services to the environmental sector in Egypt. Canadian companies are welcomed to come to this marketµlace and many have succeeded in establishing themselves locally. A preliminary sampling indicated that over 100 Canadian companies have a demonstrated interest in pursuing business opportunities in the Middle East.

There are two major trade fairs/conferences for this sector in Egypt. The first is AQUATEC which is held in November/December of each year while the second is ENVIRONMENT which is held in February, bi-annually, on the odd year. ENVIRONMENT has been very popular recently, such that, depending on its success, may be held annually. In conjunction with the Ministerial Meeting on the Montreal Protocol in Cairo, a trade fair component will be held November 24-26, 1998. The Environment 99 International Environmental Conference will be held in May/June 1999.

CONCLUSIONS AND RECOMMENDATIONS

The Egyptian private sector lacks the technical capabilities to address many of the country's environmental problems. This is a constraint to the development of an environmental business sector, particularly in the air pollution control, waste minimization, and industrial wastewater treatment sub-sectors.

Many solutions to the local environmental problems involve a combination of scientific analysis and testing, design and engineered systems, equipment procurement and installation, and on-going training, operations and maintenance services. Few private companies in Egypt are capable of fully providing solutions, and even fewer cooperate together to provide combined capabilities. Thus, local environmental solutions are often incomplete or simply inadequate.

Egypt's large engineering industry is experienced in designing certain types of civil, mechanical and chemical solutions for environmental problems, particularly for water purification, water treatment and sewer construction. However, expertise is minimal in many areas. Few engineers understand industrial waste minimization and materials recovery programs. Engineers seldom include environmental criteria in their initial building and industrial designs.

There is agreement among agents and distributors of imported environmental equipment that highly automated technologies are not suitable for Egypt, particularly when they require significant new operation and/or maintenance skills. Canadian equipment suppliers must adapt their products to meet Egyptian specifications. Generally, this means equipment that is not highly sophisticated or expensive, and is easy to maintain.

The environmental sector in Egypt offers significant potential for Canadian suppliers. Based on its still early stage of development, in terms of both regulations and standards, the sector offers good opportunities for those companies interested in entering the market on the ground floor. Canadiari firms have the advantage of a pristine reputation in both business and the environment. The potential for mutual long-term cooperation clearly exists.

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